

CLAIMS

1. A remote manipulation arm, comprising a master arm (5) handled by an operator, a slave arm (1) comprising a first tubular segment (3) engaged through a wall (2) and other segments ending on a manipulation member (12), said segments forming a jointed train (4), characterized in that the master arm and the slave arm are without any direct mechanical transmission linking them but are provided with an interface system comprising a control portion (7) and a power portion (8), the power portion being coupled with the tubular segment (3) and comprising motors (24, 25) for controlling mechanical transmissions (26, 27) included in the slave arm (5), and the control portion (7) controlling the motors in response to indications of movement accomplished on the master arm, the power portion comprises a stationary casing (13), a drum (14) rotatably mounted in the casing and attached to the tubular segment (3), a stationary motor (15) and a transmission (16), comprising a crown around the drum (14) and a member for engaging with the crown, and connecting the drum to the stationary motor.

2. The remote manipulator arm according to claim 1, characterized in that it comprises a winder of electrical cables leading to the control motors.

3. The remote manipulator arm according to claim 2, characterized in that the winder (32) comprises a free circular-arc-shaped part (34) between the drum (14) and a cylindrical portion of the casing (13), the electrical cables (36) being attached to a point of the drum and to a point of said cylindrical portion.

4. The remote manipulator arm according to claim 1, characterized in that it comprises end-of-travel switches (33) of the drum, comprising stationary portions and mobile portions mounted on a sliding carriage (42), and a helix (39) attached to the drum and engaging into a groove of the carriage.

5. The remote manipulator arm according to claim 1, characterized in that one (26) of the mechanical transmissions included in the slave arm, which drives into rotation one of the segments of the train, which is adjacent to the first segment, and the control motor (24) which drives said mechanical transmission, are placed along an axis of rotation of the first segment.

6. The remote manipulator arm according to claim 1, characterized in that two of the segments of the train are subject to sliding movements by two of the mechanical transmissions, one of which comprises a cable and the other comprises a worm screw, and in that a mechanical blocker (58) of the transmission comprising the cable is provided in the power portion of the interface system.

7. The remote manipulator arm according to claim 2, characterized in that it comprises end-of-travel switches (33) of the drum, comprising stationary portions and mobile portions mounted on a sliding carriage (42), and a helix (39) attached to the drum and engaging into a groove of the carriage.

8. The remote manipulator arm according to claim 3, characterized in that it comprises end-of-travel switches (33) of the drum, comprising stationary portions and mobile portions mounted on a sliding carriage (42), and a helix (39) attached to the drum and engaging into a groove of the carriage.

9. The remote manipulator arm according to claim 2, characterized in that one (26) of the mechanical transmissions included in the slave arm, which drives into rotation one of the segments of the train, which is adjacent to the first segment, and the control motor (24) which drives said mechanical transmission, are placed along an axis of rotation of the first segment.

10. The remote manipulator arm according to claim 3, characterized in that one (26) of the mechanical transmissions included in the slave arm, which drives into rotation one of the segments of the train, which is adjacent to the first segment, and the control motor (24) which drives said mechanical transmission, are placed along an axis of rotation of the first segment.

11. The remote manipulator arm according to claim 4, characterized in that one (26) of the mechanical transmissions included in the slave arm, which drives into rotation one of the segments of the train, which is adjacent to the first segment, and the control motor (24) which drives said mechanical transmission, are placed along an axis of rotation of the first segment.

12. The remote manipulator arm according to claim 2, characterized in that two of the segments of the train are subject to sliding movements by two of the mechanical transmissions, one of which comprises a cable and the other comprises a worm screw, and in that a mechanical blocker (58) of the transmission comprising the cable is provided in the power portion of the interface system.

13. The remote manipulator arm according to claim 3, characterized in that two of the segments of the train are subject to sliding movements by two of the mechanical transmissions, one of which comprises a cable and the other comprises a worm screw, and in that a mechanical blocker (58) of the transmission comprising the cable is provided in the power portion of the interface system.

14. The remote manipulator arm according to claim 4, characterized in that two of the segments of the train are subject to sliding movements by two of the mechanical transmissions, one of which comprises a cable and the other comprises a worm screw, and in that a mechanical blocker (58) of the transmission comprising the cable is provided in the power portion of the interface system.

15. The remote manipulator arm according to claim 5, characterized in that two of the segments of the train are subject to sliding movements by two of the mechanical transmissions, one of which comprises a cable and the other comprises a worm screw, and in that a mechanical blocker (58) of the transmission comprising the cable is provided in the power portion of the interface system.